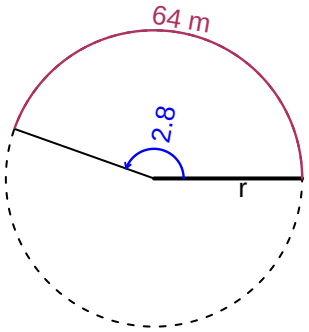
Name: Date:

Trig Final (TEST v637)

- You should have a calculator (like Desmos) and a unit-circle reference sheet.

Question 1

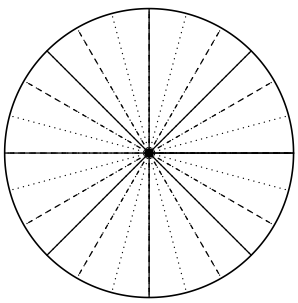
In the figure below, we see a circle and a central angle that subtends an arc. The angle measure is 2.8 radians. The arc length is 64 meters. How long is the radius in meters?



Question 2

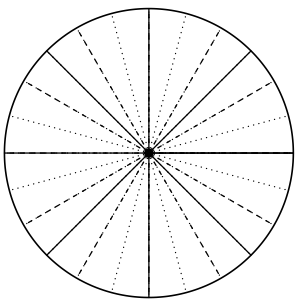
Consider angles $\frac{19\pi}{6}$ and $\frac{-9\pi}{4}$. For each angle, use a spiral with an arrow head to **mark** the angle on a circle below in standard position. Then, find **exact** expressions for $\sin\left(\frac{19\pi}{6}\right)$ and $\cos\left(\frac{-9\pi}{4}\right)$ by using a unit circle (provided separately).

Mark $\frac{19\pi}{6}$



Find $\sin(19\pi/6)$

Mark $\frac{-9\pi}{4}$



Find $\cos(-9\pi/4)$

Question 3

If $\sin(\theta) = \frac{-40}{41}$, and θ is in quadrant III, determine an exact value for $\cos(\theta)$.

Question 4

A mass-spring system oscillates vertically with a frequency of 7.71 Hz, a midline at $y = -2.04$ meters, and an amplitude of 5.48 meters. At $t = 0$, the mass is at the midline and moving down. Write an equation to model the height (y in meters) as a function of time (t in seconds).